

REMARKS

By the above amendment, independent claims 5 and 8 have been amended to recite further features of the present invention, while deleting other features, which are now set forth in newly added dependent claims 16 - 19.

More particularly, as described in connection with Figures 2 and 3 of the drawings of this application at page 11, line 12 to page 12, line 14 of the specification, the particle detector 11 scans a laser scanning region 19 which is a plane extending in a direction orthogonal to the passage through which exhaust flows in the processing chamber through the exhaust port 20 to the exhaust passage 8. It is noted that this exhaust flow region is indicated by reference numeral 18 in Figs. 1 and 2 of the drawings of this application. As described in the paragraph bridging pages 11 and 12 of the specification, the exhaust passage 18 above the exhaust port 20 is scanned in the laser scanning region 19 to capture contaminants floating in the processing chamber 1 wherein scanning the laser scanning region 19 in a direction orthogonal to the gas flowing direction in the exhaust passage 18 increase the capture rate of contaminants flowing in or floating to the exhaust port 20. Moreover, as described in the first full paragraph at page 12 of the specification, while deterioration in detection sensitivity due to fogging of a measurement window 10 has been encountered in conventional arrangements, with the aforementioned arrangement, there is provided improved contaminant capture rate enabling effective contaminant detection with suppression of fogging on the measurement window 10 and without deterioration in the detection sensitivity.

By the present amendment, claims 5 and 8 have been amended to recite the aforementioned features that a laser beam is scanned in a plane inside of the processing chamber which extends in a direction orthogonal to a direction of exhaust

flow within the processing chamber to the exhaust port, and that the measurement window is installed on the wall of the processing chamber proximate to the exhaust port and outside of a plasma generation region so as to prevent the measurement window from deterioration in detection sensitivity of the light scattered from particles inside of the processing chamber. Applicants submit that such features are not disclosed or taught in the cited art, as will become clear from the following discussion.

The rejection of claims 5, 11, 12 and 14 under 35 USC 103(a) as being unpatentable over Tsukazaki et al (US 5,837,094) in view of Gupta et al (US 6,125,789 A), Hamelin et al (US 6,951,821 B2) and Nakano et al (US 2001/0016430A1); and the rejection of claims 8, 9, 13 and 15 under 35 USC 103 over Tsukazaki et al (US 5,837,094A) in view of Gupta et al (US 6,125,789A) and Nakano et al (US 2001/0016430A1), such rejections are traversed insofar as they are applicable to the present claims and reconsideration and withdrawal of the rejections are respectfully requested.

Turning first to Tsukazaki et al, applicants note that at pages 4 and 5 of the office action, the Examiner specifically notes what “Tsukazaki does not teach”. (emphasis added). In addition to these recognized deficiencies of Tsukazaki et al, applicants submit that Tsukazaki et al provides no disclosure or teaching of scanning a laser beam in a plane which extends orthogonal to an exhaust flow direction to the exhaust port and inside of the processing chamber, nor that a measurement window is installed in a wall of the processing chamber proximate to the exhaust port and outside of a region where the plasma is generated by the plasma generator to prevent the measurement window from deterioration in detection sensitivity of the light scattered from the particles inside of the processing chamber, as now recited in

claims 5 and 8. More particularly, looking to Tsukazaki et al, as shown in Fig. 1, for example, an exhaust pipe 12 extends from the chamber 4 wherein the connection of the exhaust pipe 12 and the chamber 4 necessarily delimits an exhaust port of the chamber, and it is apparent that the particle monitor arrangement 15 is arranged at a position away from the exhaust port within the exhaust pipe 12, and does not operate in the manner defined in claims 5 and 8, nor does Tsukazaki et al disclose have a laser beam scanned within the chamber in a plane which extends in a direction orthogonal to the exhaust flow direction in the chamber to the exhaust port, as recited in claims 5 and 8. Thus, applicants submit that Tsukazaki et al provides no disclosure or teaching of the features as recited in claims 5 and 8 and dependent claims of this application. Accordingly, all claims patentably distinguish over Tsukazaki et al in the sense of 35 USC 103 and all claims should be considered allowable thereover.

With respect to Gupta et al, while this patent discloses scanning of a laser beam within a processing chamber, as described in column 5, lines 39 - 57 of Gupta et al, "gases are exhausted through an annular, base slot-shaped orifice 16 surrounding the reaction region and into a annular exhaust plenum 17". (emphasis added). Assuming that the annular slot 16 represents an exhaust port of the chamber in Gupta et al, it is readily apparent that the plane of laser scanning in Gupta et al extends in a direction parallel to the direction of exhaust flow and not in a direction which is orthogonal to exhaust flow direction, as recited in claims 5 and 8 and dependent claims of this application. Thus, irrespective of the Examiner's contentions concerning the obviousness of the combination of Gupta et al and Tsukazaki et al, applicants submit that such references, taken alone, or in

combination, fail to provide the claimed features of claims 5 and 8 and the dependent claims of this application.

As to Nakano et al, assuming arguendo that Nakano et al discloses a reflection prevention film coating on a measurement window, Nakano et al is directed to scanning a laser beam to measure particles suspended in the plasma, as illustrated in Fig. 6, and does not disclose or teach the recited features of claims 5 and 8 of scanning the laser in a plane inside of the processing chamber which extends in a direction orthogonal to a direction of exhaust flow within the processing chamber to the exhaust port so as to detect light which is scattered from particles passing through the plane. Additionally, Nakano et al does not disclose the location of the measurement window in the manner set forth in the claims so as to prevent the measurement window from deterioration in detection sensitivity of the light scattered from the particles inside of the processing chamber. Thus, applicants submit that Nakano et al, taken alone, or in combination with the other cited art also fails to provide the recited features of claims 5 and 8 and the dependent claims thereof.

With respect to Hamelin et al, whether or not Hamelin et al discloses a butterfly valve, Hamelin et al also fails to disclose or teach scanning of a laser in a plane which extends in a direction orthogonal to an exhaust flow direction to the exhaust port in the processing chamber and detecting light scattered from particles passing through the plane. Additionally, Hamelin et al also fails to provide any disclosure or teaching concerning the measurement window arranged in the manner set forth. Thus, applicants submit that Hamelin et al, taken alone or in combination with any of the other cited art, fails to provide the claimed features of claims 5 and 8 and the dependent claims of this application.

Accordingly, applicants submit that all claims patentably distinguish over any proposed combination of the references, as set forth by the Examiner, and all claims should be considered allowable thereover.

With respect to the dependent claims, applicants note that the dependent claims recite further features, which when taken into consideration with the parent claims, further patentably distinguish over the cited art in the sense of 35 USC 103, and all claims should be considered allowable thereover.

In view of the above amendments and remarks, applicants submit that all claims should be in condition for allowance and issuance of an action of a favorable nature is courteously solicited.

To the extent necessary, applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to the deposit account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (Case: 501.43537X00), and please credit any excess fees to such deposit account.

Respectfully submitted,

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